

**Site Investigation**

**Final**

**Site-Specific Field Sampling Plan Attachment**  
**for Former Smoke Area BVZ, Parcel 124(7)**  
**Fort McClellan**  
**Calhoun County, Alabama**

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**Revision 1**

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## **List of Acronyms**

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ADEM	Alabama Department of Environmental Management
CLP	Contract Laboratory Program
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
COC	chain of custody
COPC	contaminant of potential concern
CSEM	conceptual site exposure model
DOD	U.S. Department of Defense
DQO	data quality objective
EBS	environmental baseline survey
EPA	U.S. Environmental Protection Agency
ESE	Environmental Science and Engineering, Inc.
FID	flame ionization detector
FTMC	Fort McClellan
GPS	global positioning system
IDW	investigation-derived waste
IT	IT Corporation
NAD83	1983 North American Datum
NGVD	National Geodetic Vertical Datum
PID	photoionization detector
PSSC	potential site-specific chemicals
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SSHP	site-specific safety and health plan
SI	site investigation
SVOC	semivolatile organic compound
TAL	target analyte list
TCL	target compound list
TOC	total organic carbon

## **List of Acronyms** (Continued)

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USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance
VOC	volatile organic compound
WMP	waste management plan
WP	installation-wide work plan

## ***Executive Summary***

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This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT Corporation [IT], 1998a) for Former Smoke Area BVZ at Fort McClellan, Calhoun County, Alabama, will be used in conjunction with the site-specific safety and health plan (SSHP), installation-wide work plan (WP) (IT, 1998b), the habitat-specific screening ecological risk assessment work plan, and the SAP. The SAP includes the installation-wide safety and health plan, waste management plan, and installation-wide quality assurance plan. Site-specific hazard analyses are included in the SSHP.

Former Smoke Area BVZ is located southeast of the central Main Post between the post and the Skeleton Mountains in the southwest portion of Range 29. The Former Smoke Area BVZ site is wooded and overgrown with vegetation. The area shown on Figure 1-2 represents an area where fog oil drums were reportedly stored. Pieces of metal and cinder block, reportedly used as fog oil drum storage racks and supports, are visible throughout the site. There are no buildings or structures on the site except for the nearby structures shown in Figure 1-2. These structures are support buildings for training activities conducted at Range 29. These structures consist of range control offices, mess facilities, assembly pavilions, and a control tower.

Former Smoke Area BVZ falls within the "Possible Explosive Ordnance Impact Area" shown on Plate 10 of the FTMC Archive Search Report, Maps (USACE, 1998a). Therefore, IT will conduct unexploded ordnance (UXO) avoidance activities, including surface sweeps and downhole surveys of soil borings.

Specifically, IT will collect two surface soil samples, two subsurface soil samples, three surface water samples, three sediment samples, and two depositional soil samples at the site. Potential contaminant sources include petroleum products (e.g., gasoline, diesel, heating oil, waste oil, and lubricants), solvents, and metals. Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, and metals. Additionally, sediment samples will be analyzed for total organic carbon and grain size. Results will be compared with site-specific screening levels specified in the WP and regulatory agency guidelines.

## ***1.0 Project Description***

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### ***1.1 Introduction***

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of Former Smoke Area Range BVZ, under Delivery Order CK005, Contract No. DACA21-96-D-0018.

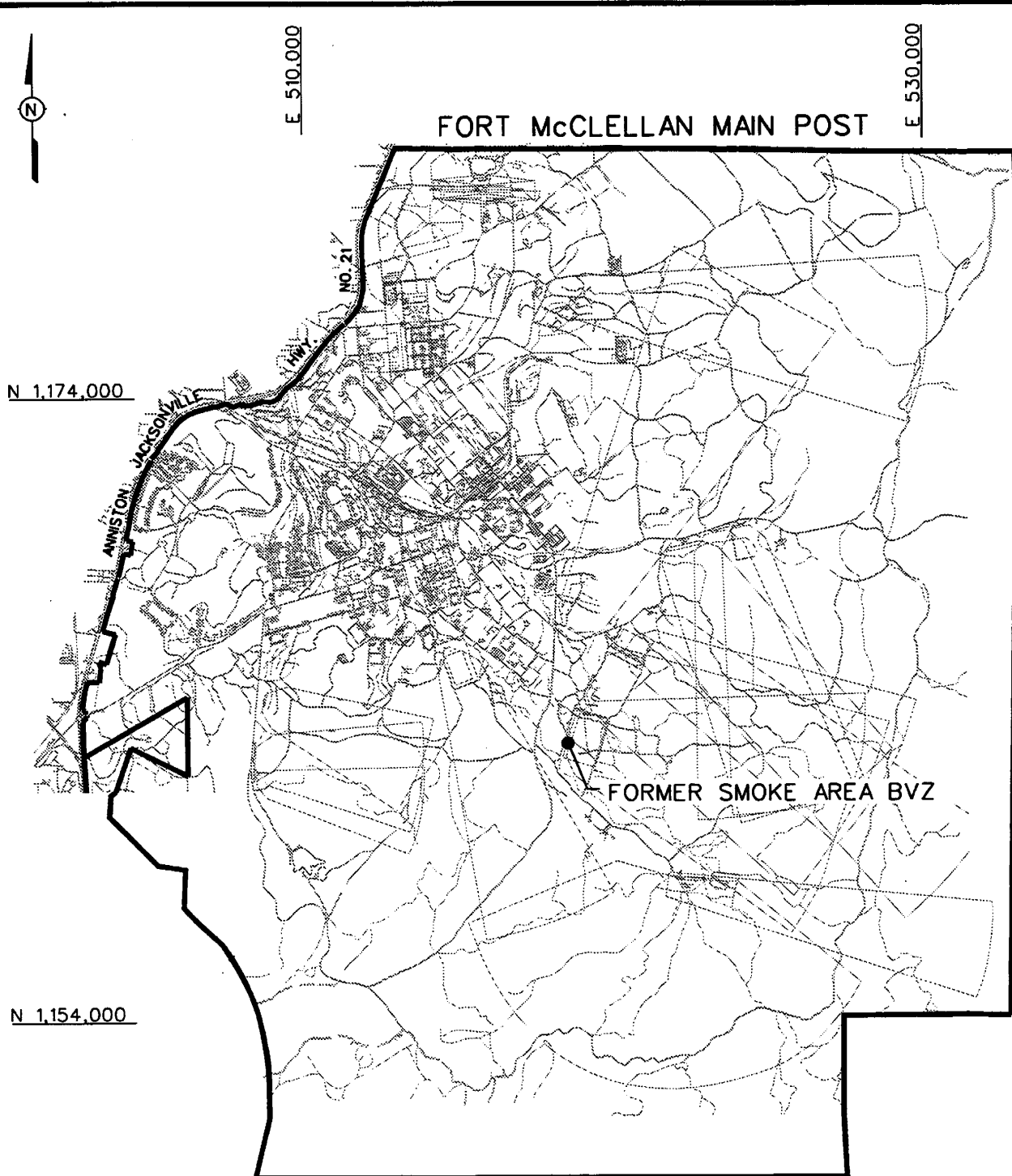
This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for FTMC, Calhoun County, Alabama has been prepared to provide technical guidance for sample collection and analysis at Former Smoke Area BVZ (Figure 1-1). The SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for Former Smoke Area BVZ site, and the installation-wide work plan (WP) (IT, 1998b), the habitat-specific screening ecological risk assessment work plan, and the SAP. The SAP includes the installation-wide safety and health plan (SHP), and waste management plan (WMP), and installation-wide quality assurance plan (QAP).

### ***1.2 Site Description***

Former Smoke Area BVZ is located southeast of the Central Main Post between the post and the Skeleton Mountains, in the southwest portion of Range 29 (Figure 1-1). The study area covers approximately 1.26 acres. The Former Smoke Area BVZ site is wooded and overgrown with vegetation. The area shown on Figure 1-2 represents an area where fog oil drums were reportedly stored. Pieces of metal and cinder block, reportedly used as fog oil drum storage racks and supports, are visible throughout the site. There are no buildings or structures on the site except for the nearby structures shown in Figure 1-2. These structures are support buildings for training activities conducted at Range 29. These structures consist of range control offices, mess facilities, assembly pavilions, and a control tower. The south branch of Cane Creek, an intermittent stream, is located approximately 250 feet southwest of the site and flows from the southeast to the northwest. The site is located on a steep west-facing slope, and is approximately 100 feet wide (east to west) and 500 feet in length (north to south). Shallow groundwater at the site is probably controlled by surface drainage and/or topography. Site elevation is approximately 870 to 900 feet above sea level as established by the National Geodetic Vertical Datum (NGVD). Figure 1-2 is a site map which shows topographic features and site boundaries.



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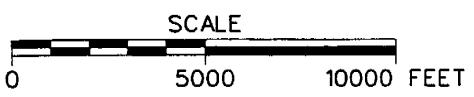
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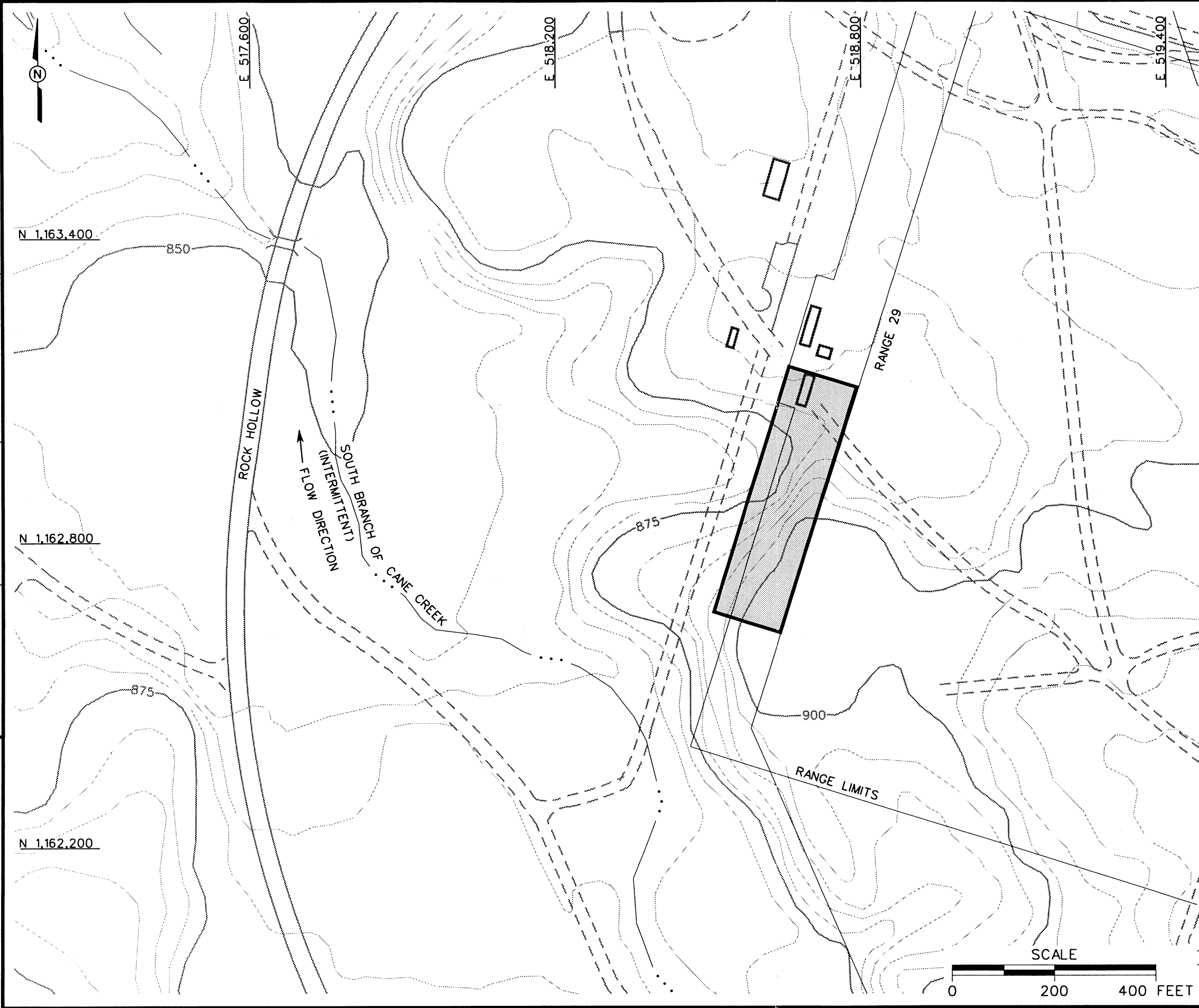
FORT McCLELLAN BOUNDARY

**FIGURE 1-1**  
**SITE LOCATION MAP**  
**FORMER SMOKE AREA BVZ**  
**PARCEL 124(7)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018



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**LEGEND**

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- BRIDGE
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK

**FIGURE 1-2**  
**SITE MAP**  
**FORMER SMOKE AREA BVZ**  
**PARCEL 124(7)**  
  
U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018  
  
 INTERNATIONAL TECHNOLOGY CORPORATION

The soil type at the Former Smoke Area BVZ is the Stony Rough Land, Sandstone Series (Ss), consisting of eroded sandstone and quartzite outcrops and escarpments covered with stunted scrub oak and scrub pine. These soils are formed by erosional forces and surface runoff. Colors are typically yellowish-brown. The depth to bedrock or groundwater is highly variable and depends on the locale, slope, or presence of fractures. The high erosion hazard, low capacity for available moisture, and thin root zone make this soil unsuited for cultivation (United States Department of Agriculture, Soil Survey, 1961).

### ***1.3 Scope of Work***

The scope of work for activities associated with the SI at Former Smoke Area BVZ, as specified in the statement of work (U.S. Army Corps of Engineers [USACE], 1998b), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Conduct a surface and near surface unexploded ordnance (UXO) survey over all areas to be included in the sampling effort.
- Provide downhole UXO support for all intrusive direct-push activity to determine downhole hazards.
- Collect two surface soil samples, two subsurface soil samples, three surface water samples, three sediment samples, and two depositional soil samples to determine whether potential site-specific chemicals (PSSC) are present at Former Smoke Area BVZ and provide data to determine future planned corrective measures and closure activities.

Upon completion of the field activities and sample analyses, draft and final summary reports will be prepared in accordance with current U.S. Environmental Protection Agency (EPA) Region IV and the Alabama Department of Environmental Management (ADEM) requirements.

## ***2.0 Summary of Existing Environmental Studies***

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Environmental Science and Engineering, Inc. (ESE) conducted an environmental baseline survey (EBS) to document current environmental conditions of all FTMC property (ESE, 1998). The study identified sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance on fast track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria.

1. Areas where no storage, release, or disposal (including migration) has occurred.
2. Areas where only storage has occurred.
3. Areas of contamination below action levels.
4. Areas where all necessary remedial actions have been taken.
5. Areas of known contamination with removal and/or remedial action underway.
6. Areas of known contamination where required response actions have not been taken.
7. Areas that are not evaluated or require further evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, EPA Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

Former Smoke Area BVZ consists of one site only. The site was identified as a CERFA site, where petroleum products were stored, released, disposed, and/or migration of hazardous substances is suspected, but are either not evaluated, or require additional evaluation to determine the environmental condition of the site.

Former Smoke Area BVZ is located southeast of the Central Main Post between the post and the Skeleton Mountains, in the southwest portion of Range 29 site used approximately 15 smoke generators, and fog oil. The fog oil was stored in 55-gallon drums, which were stored in an area measuring approximately 50 by 50 feet located at the fog line. Spills of fog oil reportedly did occur here. Surface soil and subsurface soil are the media of potential contamination within the site boundary. The slope below the site and the nearby stream also constitute potential contaminated areas and would justify surface water, sediment, and depositional soil sampling. Smoke Range BVZ was used only when all other smoke ranges were occupied. The dates of its use could not be determined. There are no buildings or structures present at the site; however, pieces of cinder block and metal that may have been previously used as fog oil drum racks are visible around the site.

There have not been any other investigations identified for the Former Smoke Area BVZ site. The site is classified as a Category 7 CERFA site: areas that are not evaluated or require further evaluation. The Former Smoke Area BVZ site lacks adequate documentation and therefore requires evaluation to determine the environmental condition of the parcel.

## ***3.0 Site-Specific Data Quality Objectives***

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### ***3.1 Overview***

The data quality objective (DQO) process is followed to evaluate data requirements and to support the decision making process associated with future action at the Former Smoke Area BVZ. The DQO process as applied to the Former Smoke Area BVZ SI is described in more detail in Section 3.2 of the WP (IT, 1998b). Table 3-1 provides a summary of the factors used to determine the sampling quantity and procedures necessary to meet the objectives of the SI and to establish a basis for future action at the site. The intended data users and available data related to the SI at the Former Smoke Area BVZ are presented in Table 3-1 and have been used to formulate a site specific conceptual model to develop this SFSP. The conceptual model ensures that the objectives of the SI are met and a basis for future action at the site is established. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide defensible information required to confirm or deny the existence and nature of residual chemical contamination in site media.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with USACE-Civil Engineering South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program (CLP)-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

### ***3.2 Data Users and Available Data***

The intended data users and available data related to the SI at the Former Smoke Area BVZ are presented in Table 3-1 and have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for information generated during field activities are primarily the EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work.

Table 3-1

**Summary of Data Quality Objectives**  
**Site Investigation, Former Smoke Area BVZ, Parcel 124(7)**  
**Fort McClellan, Calhoun County, Alabama**

Potential Data Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA ADEM USACE DOD IT Corporation Other Contractors Possible future land users	None	Contaminant Source Fuels and fuel components Waste oils, Metals	Surface Soils	SI to confirm or deny the presence of contaminants in the site media and locate source areas, if present.	Surface Soil TCL-VOCs TCL-SVOCs TAL-Metals	Definitive data in CESAS Level B data packages	2 direct-push + QC
		Migration Pathways Infiltration and leaching to groundwater.	Subsurface Soils				
		Dust emissions and volatilization from soil to air.	Surface water		Subsurface Soil TCL-VOCs TCL-SVOCs TAL-Metals		
		Infiltration to subsurface soil.	Sediment	Obtain sufficient data to support as appropriate the following:  <ul style="list-style-type: none"> <li>Implementing an immediate response.</li> <li>A no further action.</li> <li>Proceeding with a RI.</li> </ul>	Surface Water TCL VOCs TCL SVOCs TAL-Metals	Definitive data in CESAS Level B data packages	3 samples + QC
		Surface discharge of groundwater.	Depositional Soils				
		Browsing by deer. Erosion and surface runoff.			Sediments TCL VOCs TCL SVOCs TAL-Metals TOC Grain Size ASTM		
		Potential Receptors Groundskeeper FTMC personnel, sportsmen, construction worker, future resident, youthful visitor				Definitive data in CESAS Level B data packages	3 samples + QC
		PSSC Fuels Fuel components Waste oils Organics Metals			Depositional Soils TCL -VOCs TCL -SVOCs TAL-Metals	Definitive data in CESAS Level B data packages	2 samples + QC

ADEM - Alabama Department of Environmental Management.  
 ASTM - American Society for Testing and Materials.  
 CESAS - Corps of Engineers South Atlantic Savannah.  
 DOD - U.S. Department of Defense.  
 EPA - U.S. Environmental Protection Agency.  
 PSSC - Potential site-specific chemical.  
 QC - Quality control.

SVOC - Semivolatile organic compound.  
 TAL - Target analyte list.  
 TCL - Target compound list.  
 TOC - Total organic carbon.  
 USACE - U.S. Army Corps of Engineers.  
 VOC - Volatile organic compound.

### **3.3 Conceptual Site Exposure Model**

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating the potential risks to human health in the risk assessment. Graphically presenting all possible pathways by which a potential receptor may be exposed, including all sources, release and transport pathways, and exposure routes, facilitates consistent and comprehensive evaluation of risk to human health, and helps to ensure that potential pathways are not overlooked. The elements necessary to construct a complete exposure pathway and develop the CSEM include:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact with a contaminated source medium.

Potential contamination at the Former Smoke Area BVZ is due to the use of smoke generating equipment and fog oil. Petroleum products were stored, and reportedly released at this site. Smoke Area BVZ is located in the hills east of the Central Main Post in the southwest portion of Range 29. The site is surrounded by woods. The south branch of Cane Creek is located approximately 250 feet southwest of the site.

It is assumed that releases of any potential contaminants were restricted to surface soil and subsurface soil. Potential contaminant transport pathways include dust emissions and volatilization from soil to ambient air, infiltration to subsurface soil, infiltration and leaching to groundwater, discharge of groundwater to the surface, erosion and runoff to the surface water and sediment of the unnamed intermittent stream and ingestion of contaminant by browsing deer.

Current site use is best described as unrestricted open space. Plausible receptors under current site use are limited to the recreational site user. Other potential receptors considered but not included under current site use are:

- Resident: The site is not currently used for residential development.
- Groundskeeper: The site is not actively used and workers do not maintain the site.
- Construction worker: The site is currently undeveloped and excavation or building activities is not present.



As described in the Fort McClellan Comprehensive Reuse Plan, future plans call for this site to become part of Remediation Range 8, which will eventually be conveyed to the U.S. Fish and Wildlife Service for use as a National Wildlife Refuge (FTMC, 1997). The most plausible receptor for the future site use scenario is the recreational site user. The future residential receptor under the future scenario is also considered for purposes of conservatism. Future venison consumption is also considered as a viable pathway.

The contaminant release and transport mechanisms, source and exposure media, receptors and exposure pathways are summarized in Figure 3-1 and Table 3-1.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) will be addressed in a separate document to be issued as the habitat-specific screening ecological risk assessment work plan.

### ***3.4 Decision-Making Process, Data Uses, and Needs***

The decision-making process consists of a seven-step process that is presented in detail in Sections 3.2 and 4.3 of the WP and will be followed during the SI at the Former Smoke Area BVZ. Data uses and needs are summarized in Table 3-1.

#### ***3.4.1 Risk Evaluation***

Confirmation of contamination at the Former Smoke Range BVZ will be based upon a comparison of detected site contaminants to the site-specific screening levels developed in the installation-wide work plan (WP) (IT, 1998b). EPA definitive data with CESAS Level B data packages will be used to achieve detection limits sufficient to determine whether or not the established guidance criteria are exceeded in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting additional decision-making steps, such as remedial action and risk assessment, if necessary.

#### ***3.4.2 Data Types and Quality***

To meet the objectives of the SI at Former Smoke Area BVZ, it will be necessary to sample and analyze surface and subsurface soils, surface water, sediments, and depositional soils. As described in Chapter 4.0 of this SFSP, QA/QC samples will be collected for all sample types. Samples will be analyzed by EPA-approved SW-846 methods, where available; comply with EPA definitive data requirements; and be reported using hard copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.



### **3.4.3 Precision, Accuracy, and Completeness**

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Chapter 9.0 of the QAP.

## **4.0 Field Activities**

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### **4.1 UXO Survey Requirements and Utility Clearances**

The Former Smoke Area BVZ, Parcel 124(7) site falls within the “Possible Explosive Ordnance Impact Area” shown on Plate 10 of the FTMC Archive Search Report, Maps (USACE, 1998a). Therefore, IT will conduct UXO avoidance activities, including surface sweeps and downhole surveys of soil borings in addition to conducting utility clearances before installing soil borings.

#### **4.1.1 Surface UXO Survey**

An UXO sweep will be conducted over areas that will be included in the sampling and surveying activities to identify UXO on or near the surface that may present a hazard to on-site workers during field activities. Low-sensitivity magnetometers will be used to locate surface and shallow-buried metal objects. UXO located on the surface will be identified and conspicuously marked for easy avoidance. UXO personnel requirements, procedures, and detailed descriptions of the geophysical equipment to be used are provided in Chapter 4.0 and Appendices D and E of the approved SAP (IT, 1998a).

#### **4.1.2 Downhole UXO Survey**

During the soil boring and downhole sampling activities, a downhole UXO survey will be performed to determine if buried metallic objects are present. UXO monitoring, as described in Chapter 4.0 of the SAP (IT, 1998a), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet below ground surface, whichever is reached first.

#### **4.1.3 Utility Clearances**

After the UXO surface survey has cleared the area to be sampled and prior to performing any intrusive sampling, a utility clearance will be performed at all locations where soil and groundwater samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP. The site manager will mark the proposed locations with stakes, coordinate with the FTMC installation to clear the proposed locations for utilities, and obtain digging permits. Once the locations are approved (for both UXO and utility avoidance) for intrusive sampling, the stakes will be labeled as cleared.

## **4.2 Environmental Sampling**

The environmental sampling program during the SI at the Former Smoke Area BVZ includes the collection of two surface soil, two subsurface soil, three surface water, three sediment, and two depositional soil samples for chemical analysis.

### **4.2.1 Surface Soil Sampling**

Surface soil samples will be collected from two locations at the Former Smoke Area BVZ site.

#### **4.2.1.1 Sample Locations and Rationale**

Surface soil samples will be collected at the fog oil drum storage area and the lowest elevation within the parcel where runoff could potentially travel southwest to the south branch of Cane Creek. The surface soil sampling rationale is provided in Table 4-1. Proposed sampling locations are shown on Figure 4-1. Surface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact surface soil sampling locations will be determined in the field by the on-site geologist based on actual field conditions.

#### **4.2.1.2 Sample Collection Procedures**

Surface soil samples will be collected from the upper 1 foot of soil by direct-push technology in accordance with the procedures specified in Section 4.7.1.1 of the SAP. Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Surface soil samples will be screened with the PID for information only; not to select samples to submit for analysis. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1 of the QAP. Sample documentation and chain of custody (COC) will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

### **4.2.2 Subsurface Soil Sampling**

Subsurface soil samples will be collected from the same locations as the surface soil sample locations in Section 4.2.1.

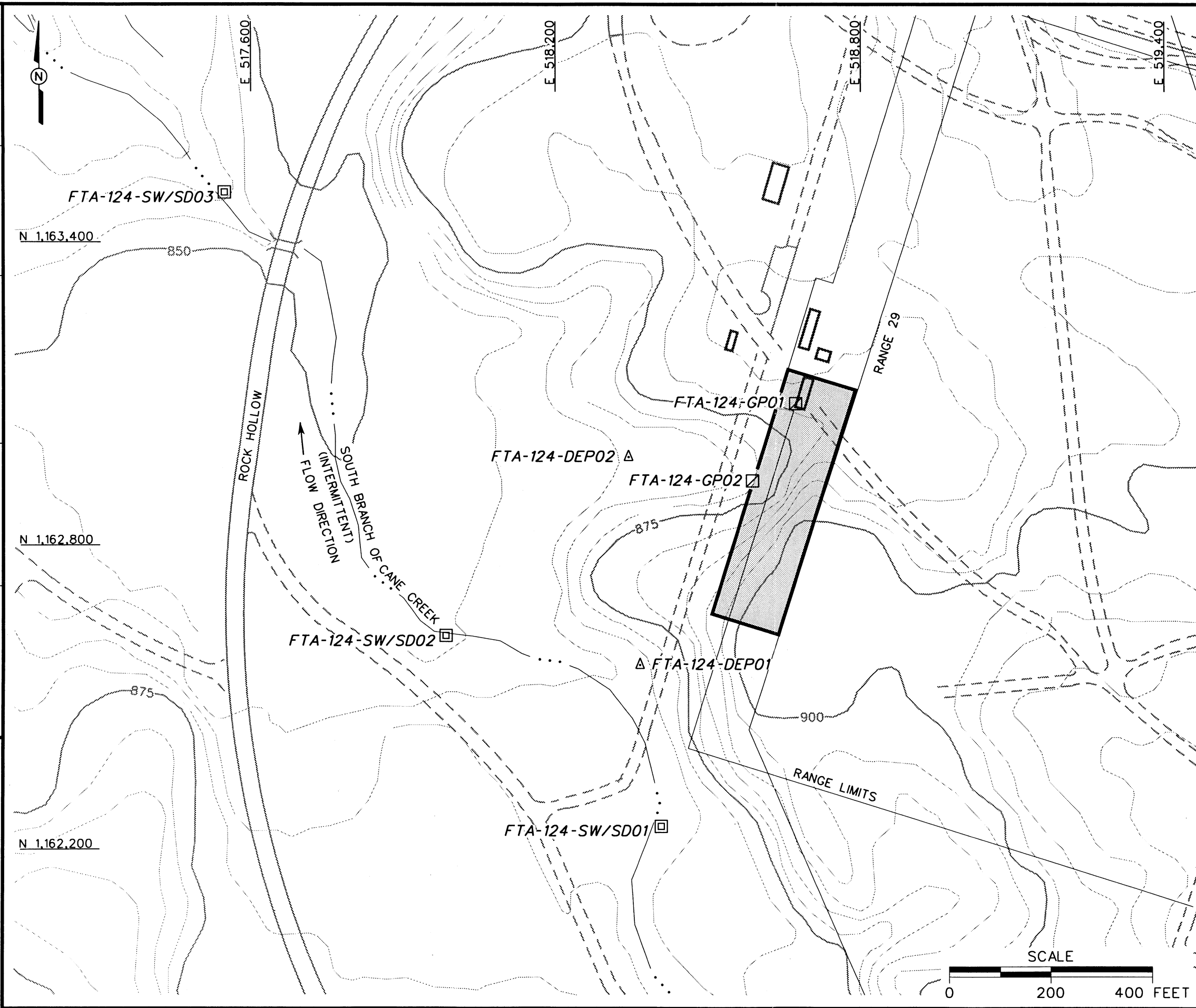
#### **4.2.2.1 Sample Locations and Rationale**

Subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is presented in Table 4-1. Subsurface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact soil boring sampling locations will be determined in the field by the on-site geologist based on actual field observations.

Table 4-1

**Site Sampling Rationale**  
**Former Smoke Area BVZ, Parcel 124(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Designation	Media Sampled	Sampling Location Rationale
FTA-124-GP01	Surface Soil Subsurface Soil	Direct-push samples will be collected at the fog oil drum storage area of Former Smoke Range BVZ. Sampling location represents a supposed spill of fog oil with resulting deposition of contaminant in the surface soil that could percolate into the subsurface soil or groundwater, or deposit dissolved materials after evaporation.
FTA-124-GP02	Surface Soil Subsurface Soil	Direct-push samples will be collected at the lowest elevation within the study parcel, where possible sheet flow or runoff can travel southwest to the south branch of Cane Creek. Sampling location represents the most likely point for collection, infiltration, and migration off parcel for groundwater.
FTA-124-SW01/SD01	Sediment Surface Water	Samples will be retrieved from the south branch of Cane Creek and downslope of the study parcel. Sampling location represents a possible deposition of contaminant that could percolate into the substratum, or move towards Ingram Creek.
FTA-124-SW02/SD02	Sediment Surface Water	Samples will be retrieved from the south branch of Cane Creek. Sampling location represents a hydrologically downgradient location in the vicinity. Sampling location represents a possible deposition of contaminant that could percolate into the substratum, or move towards Ingram Creek.
FTA-124-SW03/SD03	Sediment Surface Water	Samples will be retrieved from the south branch of Cane Creek. Sampling location represents a hydrologically downgradient location in the vicinity.
FTA-124-DEP01	Depositional Soils	Sample will be retrieved from the toe of the steepest slope immediately downslope of the site. Sampling location represents most likely deposition point for contaminant transported westward across the southern half of the site.
FTA-124-DEP02	Depositional Soils	Sample will be retrieved from the mouth of the dry valley which cuts across the site. Sampling location represents the convergence point for nearly all surface runoff originating from the Smoke Range BVZ.



**LEGEND**

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS
- PARCEL BOUNDARY
- BRIDGE
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- PROPOSED SURFACE WATER/SEDIMENT SAMPLE
- PROPOSED SOIL BORING SAMPLE
- PROPOSED DEPOSITIONAL SOIL SAMPLE

**FIGURE 4-1**  
**PROPOSED SAMPLING LOCATIONS**  
**FORMER SMOKE AREA BVZ**  
**PARCEL 124(7)**  
  
U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018  
  
 INTERNATIONAL TECHNOLOGY CORPORATION

Table 4-2

**Surface, Subsurface, and Depositional Soil Sample Designations and QA/QC Sample Quantities**  
**Former Smoke Area BVZ, Parcel 124(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-124-GP01	FTA-124-GP01-SS-FU0001-REG	0-1.0 <sup>a</sup>			FTA-124-GP01-SS-FU0001-MS	TCL VOCs, TCL SVOCs, TAL metals
	FTA-124-GP01-DS-FU0002-REG				FTA-124-GP01-SS-FU0001-MSD	
FTA-124-GP02	FTA-124-GP02-SS-FU0003-REG	0-1.0 <sup>a</sup>	FTA-124-GP02-SS-FU0004-FD	FTA-124-GP02-SS-FU0005-FS		TCL VOCs, TCL SVOCs, TAL metals
	FTA-124-GP02-DS-FU0006-REG					
FTA-124-DEP01	FTA-124-DEP01-DEP-FU0007-REG	0-1.0				TCL VOCs, TCL SVOCs, TAL metals
FTA-124-DEP02	FTA-124-DEP02-DEP-FU0008-REG	0-1.0				TCL VOCs, TCL SVOCs, TAL metals

<sup>a</sup> Actual sample depth selected for analysis will be at the discretion of the on-site geologist and will be based on field observation.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.



#### **4.2.2.2 Sample Collection Procedures**

Subsurface soil samples will be collected from soil borings at a depth greater than 1-foot bgs in the unsaturated zone. The soil borings will be advanced and soils samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP.

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is reached. A detailed lithological log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field-screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings above background (readings in ambient air). Typically, the subsurface soil sample showing the highest readings above background using the PID will be sampled and submitted to the laboratory for analysis. If none of the sample intervals collected indicate elevated readings on the PID, the deepest interval collected will be submitted for laboratory analyses. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects PSSC at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSC and/or additional sample data would provide insight to the existence of any PSSC.

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP.

Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### **4.2.3 Surface Water Sampling**

Three surface water samples will be collected from the south branch of Cane Creek, southwest of the Former Smoke Area BVZ site. Samples will be collected from hydrologically upgradient and downgradient locations from the site. The creek flows in a southeasterly direction to the northwest.

##### **4.2.3.1 Sample Locations and Rationale**

The surface water sampling rationale is listed in Table 4-1. Surface water samples will be collected from the locations proposed on Figure 4-1. The surface water sample designations and required QA/QC sample requirements are listed in Table 4-3. The exact sampling locations will

Table 4-3

**Surface Water and Sediment Sample Designations and QA/QC Sample Quantities**  
**Former Smoke Area Range BVZ, Parcel 124(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-124-SW/SD01	FTA-124-SW/SD01-SW-FU2001-REG	NA	FTA-124-SW/SD01-SW-FU2002-FD	FTA-124-SW/SD01-SW-FU2003-FS		TCL VOCs, TCL SVOCs, TAL metals
	FTA-124-SW/SD01-SD-FU1001-REG	0 - 0.5				TCL VOCs, TCL SVOCs, TAL metals, TOC, grain size
FTA-124-SW/SD02	FTA-124-SW/SD02-SW-FU2004-REG	NA			FTA-124-SW/SD02-SW-FU2004-MS FTA-124-SW/SD02-SW-FU2004-MSD	TCL VOCs, TCL SVOCs, TAL metals
	FTA-124-SW/SD02-SD-FU1002-REG	0 - 0.5				TCL VOCs, TCL SVOCs, TAL metals, TOC, grain size
FTA-124-SW/SD03	FTA-124-SW/SD03-SW-FU2005-REG	NA				TCL VOCs, TCL SVOCs, TAL metals
	FTA-124-SW/SD03-SD-FU1003-REG	0 - 0.5				TCL VOCs, TCL SVOCs, TAL metals, TOC, grain size

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

TOC - Total organic carbon.

VOC - Volatile organic compound.

be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

#### ***4.2.3.2 Sample Collection Procedures***

Surface water samples will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.5.

#### ***4.2.4 Sediment Sampling***

Three sediment samples will be collected from the stream bed of the south branch of Cane Creek located southwest of Former Smoke Area BVZ. These sediment samples will be collected at the same locations as the surface water samples described in Section 4.3.4.

##### ***4.2.4.1 Sample Location and Rationale***

The tentative locations for the two sediment samples are shown in Figure 4-1. Sediment sampling rationale is presented in Table 4-1. Sediment sample designations and required QA/QC sample requirements are listed in Table 4-2. The actual sediment sample points will be at the discretion of the ecological sampler, based on the drainage pathways and actual field observations.

##### ***4.2.4.2 Sample Collection Procedures***

Sediment samples will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. The sediment samples will be analyzed for the parameters listed in Section 4.5.

#### ***4.2.5 Depositional Soil Sampling***

Two depositional soil samples will be collected at the Former Smoke Area BVZ site.

##### ***4.2.5.1 Sample Locations and Rationale***

The depositional soil samples will be collected from the toe of the steepest slope immediately downslope of the site. The sampling rationale is listed in Table 4-1 and the proposed sampling location is shown on Figure 4-1. The depositional soil sample designation, depth, and required QA/QC sample quantities are listed in Table 4-2. The actual depositional soil sample point will

be at the discretion of the ecological sampler, based on the physical characteristics of the drainage area and actual field observations.

#### ***4.2.5.2 Sample Collection Procedures***

Depositional soil sample collection will be conducted in accordance with the procedures for surface soil sample collection specified in Section 4.9.1.1 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5.

#### ***4.3 Decontamination Requirements***

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP. Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

#### ***4.4 Surveying of Sample Locations***

Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the Alabama State Plane Coordinate System, 1983 North American Datum (NAD83). Elevations will be referenced to the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 (soon to be established on site).

Horizontal coordinates for soil, sediment, and surface water sampling locations will be recorded using a GPS to provide accuracy within 1 meter.

Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.17 of the SAP.

#### ***4.5 Analytical Program***

Samples collected at the locations specified in Chapter 4.0 of this SFSP will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as EPA,

ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the Former Smoke Area BVZ site consist of the following analytical suite:

- Target compound list (TCL) volatile organic compounds - Method 5035/8260B
- TCL semivolatile organic compounds - Method 8270C
- Target analyte list (TAL) metals - Method 6010B/7000

In addition, the sediment samples will be analyzed for the following list of parameters:

- Total organic carbon - Method 9060
- Grain size -American Society for Testing and Materials D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-4 of this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported by the laboratory via hard copy data packages using CLP-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

#### ***4.6 Sample Preservation, Packaging, and Shipping***

Sample preservation, packaging, and shipping will follow the procedures as specified in Section 4.13.2 of the SAP. Completed analysis request/chain-of-custody records will be secured and included with each shipment of coolers to:

Sample Receiving  
Quanterra Environmental Services  
5815 Middlebrook Pike  
Knoxville, Tennessee 37921  
Telephone: (423) 588-6401

Split samples collected for the USACE laboratory will be shipped to the following address:

USACE South Atlantic Division Laboratory  
Attn: Sample Receiving  
611 South Cobb Drive  
Marietta, Georgia 30060  
Telephone: (770) 919-5270.

Table 4-4

**Analytical Samples**  
**Former Smoke Area BVZ, Parcel 124(7)**  
**Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples <sup>a</sup>					Quanterra	
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Spits w/ QA Lab (5%)	MSMSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Total No. Analysis	QA Lab Total No. Analysis
Former Smoke Range BVZ - Parcel 124(7): 3 surface water, 9 soil matrix: 2 surface, 2 subsurface, 3 sediment, 2 depositional soils													
TCL VOCs	8260B	water	normal	3	1	3	1	1	1	1	1	8	1
TCL SVOCs	8270C	water	normal	3	1	3	1	1	1	1	1	7	1
Tot TAL Metals	6010B/7000	water	normal	3	1	3	1	1	1	1	1	7	1
TCL VOCs	8260B	soil	normal	9	1	9	1	1	1	1	1	13	1
TCL SVOCs	8270C	soil	normal	9	1	9	1	1	1	1	1	13	1
TAL Metals	6010B/7000	soil	normal	9	1	9	1	1	1	1	1	13	1
Former Smoke Area BVZ Total:				36			6	6	6	1	1	61	6

<sup>a</sup>Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded up to the nearest whole number.

Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

Ship samples to:	Quanterra Environmental Services	USACE Laboratory split samples	USACE South Atlantic Division Laboratory
	5815 Middlebrook Pike	are shipped to:	Attn: Sample Receiving
	Knoxville, Tennessee 37921		611 South Cobb Drive
	Attn: John Reynolds		Marietta, Georgia 30060-3112
	Tel: 423-588-6401		Tel: 770-919-5270
	Fax: 423-584-4315		

QA/QC - Quality assurance/quality control.  
MS/MSD - Matrix spike/matrix spike duplicate.  
VOC - Volatile organic compound.  
SVOC - Semivolatile organic compound.  
TAL - Target analyte list.  
TCL - Target compound list.  
TOC - Total organic carbon.

#### ***4.7 Investigation-Derived Waste Management***

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP. The IDW expected to be generated at Former Smoke Area BVZ will include decontamination fluids and disposable personal protective equipment. The IDW will be staged inside the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

#### ***4.8 Site-Specific Safety and Health***

Safety and health requirements for this SI are provided in the SSHP attachment for Former Smoke Area BVZ, Parcel 124(7). The SSHP attachment will be used in conjunction with the SHP.

## ***5.0 Project Schedule***

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The project schedule for the site investigation activities will be provided by the IT project manager to the BRAC Closure Team on a monthly basis.



## **6.0 References**

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Environmental Science and Engineering Inc. (ESE), 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

Fort McClellan (FTMC), 1997, *Fort McClellan Comprehensive Reuse Plan*, prepared under contract to the Calhoun County Commission, November.

IT Corporation (IT), 1998a, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, August.

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U.S. Army Corps of Engineers (USACE), 1998, *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama*, June.

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U.S. Environmental Protection Agency (EPA), 1993, *Data Quality Objectives Process for Superfund, Interim Final Guidance*, EPA 540-R-93-071, September.